

SUBJECT: THE "CITY OF RICHMOND URBAN FOREST MANAGEMENT/MASTER PLAN REFORESTATION SUPPLEMENT"

To all citizens, officials or experts concerned with trees:

Attached, please see the "Reforestation Supplement" created by Thomas Pehrson for the City of Richmond Parks & Landscaping Division. This "Reforestation Supplement" has been approved for use by the Parks and Recreation Commission and City Council. This document is provided to accomplish the following basic objectives:

- o Act as an easy reference handout for designers, developers or individual citizens wishing to do tree-related business within the City of Richmond. This document is meant as a brief update of the considerably larger Urban Forest Management/Master Plan (also written by Thomas Pehrson).
- o Update the tree species selection list by area within the City of Richmond. These tree selection areas can be seen in the attached as Central Richmond, Richmond Annex, Marina/Harbor, El Sobrante, Hilltop and Richmond Parkway and Point Richmond/Point Molate. Tree selection areas were arrived at after careful consideration of localized common soil conditions, wind patterns and cultural habits essential to the survivability of individual species.
- o Update the tree species selection list and planting technique to reflect current knowledge developed on the survivability of trees in an urban environment. University of California studies and well-known experts like Barrie Coate have been consulted, as well as local urban planners.

The overbridging objective is to ensure that City of Richmond property owners enjoy the best known selection and planting of the urban forest and so realize growing value for the community over time. Central to this is a simple to understand target of the right tree for the right place.

Periodically, this Division shall authorize the location, deletion, addition or substitution of tree species on the attached lists as a continuing assurance of proper selection. Because diversity is an important criteria supporting a healthy urban forest, tree lists are meant to be more inclusionary than exclusionary in nature. Some trees continue to be listed for an continuity of appearance where a gap needs to be filled in an existing avenue of the same species. Other species, such as the palm selections in the Marina/Harbor area, have a form not in keeping with street tree uses but can be placed in deeper landscape treatments. Only trees with smaller stature and noninvasive root systems need to be placed in narrow planting strips any more. Because the attached document is provided as a minimum standard, designers may specify additions of irrigation, root guards, soil amendments, drainage or other components that, in their best judgment, will

contribute to the survivability of a tree. A quarantine may have to be imposed, however, due to unforeseen pest or hazard conditions occurring in a species. Designers will do best to contact this office during the earliest stages of a project for confirmation and advice. A soils fertility lab test report is always recommended to match the right tree to very localized conditions.

Trees being locate in or near public spaces will be required to conform to the following minimum clearances:

- o 10 feet from driveways
- o 10 feet from fire hydrants
- o 10 feet from light poles
- o 5 feet from manhole or utility box
- o 5 feet from telephone or other poles
- o 5 feet from parking meters and street signs
- o 25 feet from street intersections
- o 6 feet from any underground utility
- o branching canopy 14 feet above vehicle traffic
- o branching canopy 11 feet above pedestrian traffic

Site conditions may require adjustments up from the minimum footage noted above.

Finally, the fall months of the year are the best time to plant trees in this part of California. To this end, the City of Richmond has adopted the third Wednesday of each October as its own official Arbor Day for observances and the start of planting season.

Anthony Norris, Parks & Landscaping Superintendent



City of Richmond Urban Forest Management/Master Plan
Reforestation Supplement

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Community & Cultural Services Program

Parks & Landscaping Division

Street Tree Selection



Selection of street tree species is a long-term commitment by the City to the beauty of the community and to the cost of maintaining those trees. Since municipal budgets are increasingly stretched, it is ever more important that tree species chosen for municipal planting be as free of problems and the necessity for frequent pruning as possible. One of the best ways to minimize those costs is to use only species or selected cultivars that are specifically chosen for their preference for the environmental conditions in which they must grow. A well-adapted tree will have far fewer disease and insect problems and will live a much longer useful life.

In viewing tree populations throughout the state one essentially sees the same palette of tree selections repeated over and over. The variety of trees available and suitable for the urban environment far exceeds what is seen. The tendency is for municipal tree managers to only plant what is currently made immediately available from nurseries. With advanced notification, several nurseries would be willing to grow many of the less commonly produced trees found on the Tree Selection List. Of course such advanced planning is not always possible, therefore we have made both neighborhood and major street tree selections incorporating both commonly available tree species as well as those less commonly available.

Design Guidelines

Although diversity is important in street tree management, from an architectural perspective, a single species planting of the same age provides aesthetic unity to a neighborhood or street. The goal of this plan will be to establish uniform

plantings of large trees along identified major streets while within neighborhood residential streets a diverse mixture of species is recommended.

In situations where entire blocks may be planted at once, there exists the opportunity for implementing a pattern of trees planting. Several schemes are possible but in general an alternating planting pattern of two or three species is probably the most effective and practical to do. Where alternative species are proposed, trees should be alternated whenever possible. In locations where several plantings sites exist in a row, trees should be used with equal frequency with a minimum ratio of 1 to 3. No more than 4 instances of the same species should be used consecutively before changing to an alternate species. Consideration should also be given to adjacent buildings in the selection of species. In general, columnar or pyramidal trees should be favored in front of multi-story or commercial buildings, especially those with shallow setbacks. Conversely, broad spreading trees could be favored in front of one-story buildings with deep setbacks, especially low-slung buildings, such as bungalows. There may be street sections where street trees should not be used.

A goal of this plan should be to establish representatives of all the species on the Tree Selection List. A possible street tree arboretum in one of the city parks has been suggested. This would provide a single location where residents, planners, and architects could view selected trees. It could also provide a testing location for newer species untried in Richmond.

Tree Selection Areas

The city of Richmond can be divided between six major areas including Point Richmond, Hilltop and the Richmond Parkway Area, Richmond annex, Central Richmond, El Sobrante, and the Marina. Each area was reviewed to determine which species would perform best and enhance the aesthetic appeal of the neighborhood. The results of that review are described below.

Central Richmond – The core area of Richmond is typified by nearly flat topography of poorly drained clay soils. The area bordered by 23rd, McDonald Ave, San Pablo Ave, and Rheem Ave has soil of the moderately well drained Tierra soil series.

Selections:

SCIENTIFIC NAME	CULTIVAR	COMMON NAME
Acer campestre		Hedge Maple
Acer nigrum	'Green Column'	Black Maple
Acer pseudoplatanus		Sycamore Maple
Acer rubrum	'Armstrong'	Armstrong Maple
Acer rubrum	'October Glory'	October Glory Maple
Aesculus carnea	'Brioti'	Red Horsechestnut

SCIENTIFIC NAME	CULTIVAR	COMMON NAME
Arbutus 'Marina'		Marina Strawberry Tree
Carpinus betulus	'Fastigiata'	Fastigate Hornbeam
Celtis australis		European Hackberry
Celtis sinensis		Chinese Hackberry
Crateagus phaenopyrum		Washington Hawthorn
Eucalyptus ficifolia		Scarlet Gum
Eucalyptus polyanthemos		Silver Dollar Gum
Fraxinus americana	'Autumn Purple'	American Ash
Fraxinus holotricha	'Moraine'	Moraine Ash
Fraxinus oxycarpa	'Raywood'	Raywood Ash
Geijera parvifolia		Australian Willow
Ginkgo biloba	'Autumn Gold'	Autumn Gold Maidenhair Tree
Ginkgo biloba	'Fairmont'	Fairmont Maidenhair Tree
Koelreuteria bipinnata		Chinese Flame Tree
Koelreuteria paniculata		Golden Rain Tree
Lagerstroemia indica	'Natchez'	Natchez Crape Myrtle
Laurus nobilis		Sweet Bay Laurel
Laurus x 'Saratoga'		Hybrid Laurel
Magnolia grandiflora	'Russet'	Southern Magnolia
Magnolia grandiflora	'St. Mary'	Southern Magnolia
Melaleuca linariifolia		Flax-leaved Paperbark
Melaleuca quinquenervia		Cajeput Tree
Metrosideros excelsus		New Zealand Christmas Tree
Nyssa sylvatica		Tupelo
Pinus canariensis		Canary Island Pine
Pistachia chinensis		Chinese Pistacio
Platanus acerifolia	'Yarwood'	London Plane
Prunus cerasifer	'Krauters Vesuvius'	Flowering plum
Pyrus calleryana	'Red Spire'	Red Spire Pear
Pyrus calleryana	'Chanticleer'	Chanticleer Pear
Quercus agrifolia		Coast Live Oak
Quercus ilex		Holly Oak
Quercus suber		Cork Oak
Quercus virginiana		Southern Live Oak
Rhamnus alaternus		Italian Buckthorn
Sapium sebiferum		Chinese Tallow
Sophora japonica	'Regent'	Scholar Tree
Tilia cordata	'Chancellor'	Little-Leaf Linden
Tristania conferta		Brisbane Box
Tristania laurina		Swamp Myrtle
Ulmus 'Frontier'		Frontier Hybrid Elm

Richmond Annex -This area is greatly affected by its proximity to the Bay. Because of this, trees planted in this area must be tolerant of constant salt laden winds. Some portions of this area, such as the area near East Shore Park, have black, alkaline clay soils. Other areas have neutral brown soils of excellent quality, as on Portrero Avenue. These conditions will support virtually any plant desired.

Where the microsite is wind protected, the only controlling factors in tree selection are soil type and available rooting volume. Since many of the planting spaces here are generous, large growing, tough trees should be used here.

SCIENTIFIC NAME	CULTIVAR	COMMON NAME
<i>Acer campestre</i>	'Queen Elizabeth'	Hedge Maple
<i>Betula nigra</i>	'Heritage'	Heritage River Birch
<i>Celtis australis</i>		European Hackberry
<i>Eucalyptus gunnii</i>		Cider Gum
<i>Eucalyptus polyanthemos</i>		Silver Dollar Gum
<i>Fraxinus holotricha</i>	'Moraine'	Moraine Ash
<i>Fraxinus oxycarpa</i>	'Raywood'	Raywood Ash
<i>Ginkgo biloba</i>	'Fairmont'	Fairmont Maidenhair Tree
<i>Koelreuteria paniculata</i>		Golden Rain Tree
<i>Melaleuca quinquenervia</i>		Cajeput Tree
<i>Metrosideros excelsus</i>		New Zealand Christmas Tree
<i>Pinus canariensis</i>		Canary Island Pine
<i>Pyrus calleryana</i>	'Red Spire'	Red Spire Pear
<i>Quercus suber</i>		Cork Oak
<i>Quercus virginiana</i>		Southern Live Oak
<i>Quercus ilex</i>		Holly Oak
<i>Sophora japonica</i>	'Regent'	Scholar Tree
<i>Tristania conferta</i>		Brisbane Box

Marina/Harbor Area - The soils in the Marina/Harbor are composed of bay fill mud, which is a gray, alkaline clay, with very poor percolation rates. Where sand has been laid in at a depth of two to three feet over bay mud, the root environment in the sand is improved. The poor conditions below the sand, however, still determine long-term tree success.

This area's proximity to the ocean means that trees must be selected for their tolerance not just of soil conditions, but to constant salt laden winds as well.

SCIENTIFIC NAME	CULTIVAR	COMMON NAME
<i>Arbutus</i> 'Marina'		Marina Strawberry Tree
<i>Chamaerops humilis</i>		Meditarranean Fan Palm
<i>Koelreuteria paniculata</i>		Golden Rain Tree
<i>Melaleuca quinquenervia</i>		Cajeput Tree
<i>Metrosideros excelsus</i>		New Zealand Christmas Tree
<i>Phoenix canariensis</i>		Canary Island Date Palm
<i>Pinus canariensis</i>		Canary Island Pine
<i>Pyrus calleryana</i>	'Red Spire'	Red Spire Pear
<i>Pyrus calleryana</i>	'Chanticleer'	Chanticleer Pear
Purchase from Oregon:		
<i>Acer campestre</i>	'Queen Elizabeth'	Hedge Maple
<i>Acer nigrum</i>	'Green Column'	Black Maple
Experimental trees:		
<i>Melaleuca styphellioides</i>		Prickly Paperbark

El Sobrante Area - The climate of this area of Richmond is warmer in summer and cooler in winter than other parts of the City, due to its more inland location. The soils range from alkaline black clay to reasonably good tan, neutral clay. Tree selection in this area must be based on drought tolerance, adaptability to the planting space available, and the soil type of the site. If black or gray soil is encountered at the proposed planting area, only species listed as tolerant of alkaline conditions should be used.

Selections:

SCIENTIFIC NAME	CULTIVAR	COMMON NAME
Alkaline Soils:		
Koelreuteria paniculata		Golden Rain Tree
Melaleuca quinquenervia		Cajeput Tree
Melaleuca styphellioides		Prickly Paperbark
Phoenix canariensis		Canary Island Palm
Tristania conferta		Brisbane Box
Tan to Brown Soils:		
Aesculus carnea	'Briotti'	Red Horsechestnut
Celtis australis		European Hackberry
Celtis sinensis		Chinese Hackberry
Eucalyptus ficifolia		Scarlet Gum
Eucalyptus polyanthemos		Silver Dollar Gum
Fraxinus holotricha	'Moraine'	Moraine Ash
Fraxinus oxycarpa	'Raywood'	Raywood Ash
Geijera parvifolia		Australian Willow
Ginkgo biloba	'Fairmont'	Fairmont Maidenhair Tree
Koelreuteria bipinnata		Chinese Flame Tree
Lagerstroemia indica	'Natchez'	Natchez Crape Myrtle
Magnolia grandiflora	'Russet'	Southern Magnolia
Magnolia grandiflora	'St. Mary'	Southern Magnolia
Melaleuca linariifolia		Flax-leaved Paperbark
Pistachia chinensis		Chinese Pistacio
Pyrus calleryana	'Red Spire'	Red Spire Pear
Pyrus calleryana	'Chanticleer'	Chanticleer Pear
Quercus agrifolia		Coast Live Oak
Quercus suber		Cork Oak
Quercus virginiana		Southern Live Oak
Sapium sebiferum		Chinese Tallow
Sophora japonica	'Regent'	Scholar Tree
Tristania laurina		Swamp Myrtle
Purchase from Oregon:		
Acer rubrum	'Armstrong'	Armstrong Maple
Acer rubrum	'October Glory'	October Glory Maple
Carpinus betulus	'Fastigiata'	Fastigate Hornbeam
Fraxinus americana	'Autumn Purple'	American Ash
Tilia americana	'Redmond'	Redmond Linden
Tilia cordata	'Chancellor'	Little-Leaf Linden
Experimental trees:		
Laurus x 'Saratoga'		Hybrid Laurel
Nyssa sylvatica		Tupelo
Quercus robur	'Skymaster'	Pyramidal English Oak
Ulmus 'Frontier'		Frontier Hybrid Elm

Hilltop and Richmond Parkway - Many parts of this area have very poor soils, additionally, strong winds are present in this area much of the time, increasing the chance for wind throw either because of inadequate root establishment, wind sail in the crown, or a combination of the two factors.

For these reasons, species selection as well as plant size at time of planting are especially critical if the investments in establishing new trees are to be realized in the future. Species that produce very dense foliage or trees that may produce a large crown without sufficient supporting roots, should not be used in these areas. Preference should be for well branched 5 gallon container specimens. Additionally the use of multi-stemmed evergreen trees is to be encouraged in all excessively windy sections of Richmond.

It should be noted that an overly wet soil condition will exacerbate the wind throw potential since a broad, extensive root system is inhibited by over-wet soils.

SCIENTIFIC NAME	CULTIVAR	COMMON NAME
<i>Celtis australis</i>		European Hackberry
<i>Eucalyptus polyanthemos</i>		Silver Dollar Gum
<i>Fraxinus holotricha</i>	'Moraine'	Moraine Ash
<i>Fraxinus oxycarpa</i>	'Raywood'	Raywood Ash
<i>Koelreuteria paniculata</i>		Golden Rain Tree
<i>Melaleuca linariifolia</i>		Flax-leaved Paperbark
<i>Melaleuca quinquenervia</i>		Cajeput Tree
<i>Metrosideros excelsus</i>		New Zealand Christmas Tree
<i>Pinus canariensis</i>		Canary Island Pine
<i>Pistachia chinensis</i>		Chinese Pistacio
<i>Platanus acerifolia</i>	'Yarwood'	London Plane
<i>Pyrus calleryana</i>	'Red Spire'	Red Spire Pear
<i>Quercus agrifolia</i>		Coast Live Oak
<i>Sophora japonica</i>	'Regent'	Scholar Tree
<i>Tristania conferta</i>		Brisbane Box
<i>Tristania laurina</i>		Swamp Myrtle
Purchase from Oregon:		
<i>Acer campestre</i>	'Queen Elizabeth'	Hedge Maple
<i>Acer nigrum</i>	'Green Column'	Black Maple
<i>Acer psuedoplatanus</i>		Sycamore Maple
<i>Fraxinus americana</i>	'Autumn Purple'	American Ash

Point Richmond/Point Molate - The residential area of Point Richmond tend to be rural in nature, lacking sidewalks and curbs. City efforts at reforestation should concentrate on the downtown commercial area.

Soils in the Point Richmond area are in the Millsholm series. Drainage may be a problem in some areas.

Scientific Name	Cultivar	Common Name
<i>Crateagus phaenopyrum</i>		Washington Hawthorn
<i>Laurus x 'Saratoga'</i>		Hybrid Laurel

Scientific Name	Cultivar	Common Name
<i>Metrosideros excelsus</i>		New Zealand Christmas Tree
<i>Pyrus calleryana</i>	'Red Spire'	Red Spire Pear
<i>Quercus agrifolia</i>		Coast Live Oak
<i>Quercus suber</i>		Cork Oak
<i>Tristania conferta</i>		Brisbane Box
<i>Tristania laurina</i>		Swamp Myrtle

CITY OF RICHMOND NURSERY STANDARDS

PURPOSE:

To obtain vigorous, healthy trees which can be easily trained into attractive trees with structurally strong roots and crowns.

SPECIFICATIONS

(The CITY will choose and/or modify the appropriate sections depending on the species, the landscape site, and the intended function of the tree.)

- I All trees shall be true to type or name as ordered or shown on the plans and shall be individually tagged or tagged in groups by species and cultivar (variety).
- II All trees shall be healthy, have a form typical for the species or cultivar, be well-rooted, and properly trained. These characteristics are described in Sections III, IV, and V below.
- III All trees shall comply with federal and state laws requiring inspection for plant diseases and pest infestations. Inspection certificates required by law shall accompany each shipment of plants. Clearance from the county agricultural commissioner, as required by law, shall be obtained before planting trees delivered from outside the county in which they are to be planted.
- IV The root-ball of all trees shall be moist throughout, and the crown shall show no signs of moisture stress.
- V The following criteria apply primarily to broad-leaved decurrent trees:

Tree Crown

- A. Each tree should have a single, fairly straight trunk that has not been headed or that could be pruned to a central leader.
 - 1. Trees should have potential lateral scaffold branches (height of lowest scaffold depends on landscape use):
 - a. For small-growing trees (crape myrtle, flowering fruit trees), branches should be at least 2 inches apart vertically; trees could be trained in the landscape to 3-7 branches, 4 inches or more apart vertically.

For large-growing trees (ash, oak), branches should be at least 6 inches apart vertically; trees could be trained in the landscape to 5-9 branches, 18 inches or more apart vertically.

- b. Branches should be radially distributed around the trunk.
 - c. Branches should not be more than two thirds ($2/3$) the diameter of the trunk, measured 1 inch above the branch.
 - d. Branch attachments should be free of included bark (bark embedded between the trunk and a lateral).
- 2. No lateral branches below the lowest potential scaffold should be larger one-fourth the trunk diameter at point of attachment.
- 3. Each tree must be able to comply with Numbers 1 and 2 above without having removed or having to remove, now or with the previous growing season (at least six months) more than twenty-five (25) percent of the branches of size similar to, or larger than, those of the potential scaffold branches.
- B. The minimum acceptable length of the most recent season's shoots should be specified. For example, shoots of such slow-growing trees as red maple, red oak, ginkgo might be 8 inches, and for fast-growing trees, the minimum acceptable length might be 12 inches and preferably 24-36 inches.
- C. The following would be desirable:
 - 1. The tree should stand upright without support, unless the tree is bare root.
 - 2. The tree should have small (less than $1/4$ diameter of trunk) temporary branches along the trunk below the scaffold branches.

Roots

The following applies to container, boxed, or balled and burlapped trees regardless of species or mature size:

- D. The tree should be free of roots greater than one fifth ($1/5$) the trunk diameter visibly circling the trunk and free of "knees" (roots) protruding above the soil.
 - E. If in a tapered container, slip the root-ball out; the root-ball periphery should be free of circling roots larger than $1/4$ inch in diameter or a mat of $1/4$ inch or larger roots (acceptable diameters of circling peripheral roots depend on species and size of container).
 - F. Untie the tree trunk from the stake; the trunk should not touch the top rim of the container.
 - G. Tip the root-ball or container on its side and with a small jet of water expose the roots within 2 inches of the trunk to a depth of 2- $1/2$ inches below the topmost root attached to the trunk. The trunk should be free of circling roots as in Item D and kinks in the main root(s). Replace soil washed from around the trunk with a similar soil mix (less than ten percent of the total root-ball volume should need to be added) .
 - H. If the trees pass the above inspections, the roots will be further inspected by removal of the soil from the roots of not less than two (2) trees nor more than two (2) percent of the total number of trees of each species or variety from each source. The trunk and main roots shall be free of serious circling and kinked roots. Circling roots at the periphery of the root-ball shall not be reason for rejecting a tree unless they are large for the species and shoot growth is not acceptable for the species (see Section V, Item E).
- VI In case the sample trees inspected are found to be defective, the buyer reserves the right to reject the tire lot or lots of trees represented the defective samples. Any plants rendered unsuitable for planting because of this inspection will be considered as samples and will not be paid for.
- VII The buyer shall be notified when plants are to be shipped at least ten (10) days prior to the actual shipment date, or the buyer may request to select the plants at the nursery before delivery.

Suggested Tree Planting Specifications for Richmond

Site Preparation

Standard Site Preparation for 15 gallon trees - Entails excavation of 36 square foot sites to a depth of 3 feet. A planting pedestal is left unexcavated at about 16 inches below grade to support the tree rootball. The pedestal is shown in graphic details. Sites should be left with soil mounded to the center and no clods in the upper 12 inches; this may require rototilling. Best site preparation can be accomplished using a backhoe. The pedestal is created by digging from two sides at right angles. It may also be accomplished using a Bobcat type tractor with a front mounted trenching tool. Amendments will be blended during the excavation and backfill operation.

Planting

Root Crown Height - In turf areas, tree root crown height is to be a minimum 2 inches above surrounding soil grade. On parkway and open sites, tree root crown is to be slightly above grade, never below. Tree root crowns that settle below specified height shall be immediately corrected by contractor and watered again immediately after.

Root Pruning - All tree root balls are to be cut vertically to a 2" depth on four sides before planting. The tool used to prune the roots shall be sharp and all roots are to be cut cleanly. Where partially circling roots can be straightened rather than severed, this shall be attempted prior to the vertical cuts in the root ball.

Root Ball Scarification - The outer surface of the root ball shall be scarified by hand after the tree is in place into the hole and prior to back filling around the tree. The back fill immediately around the tree shall be a hand blend of container soils resulting from root ball Scarification and loose (no rocks or clods) site soil.

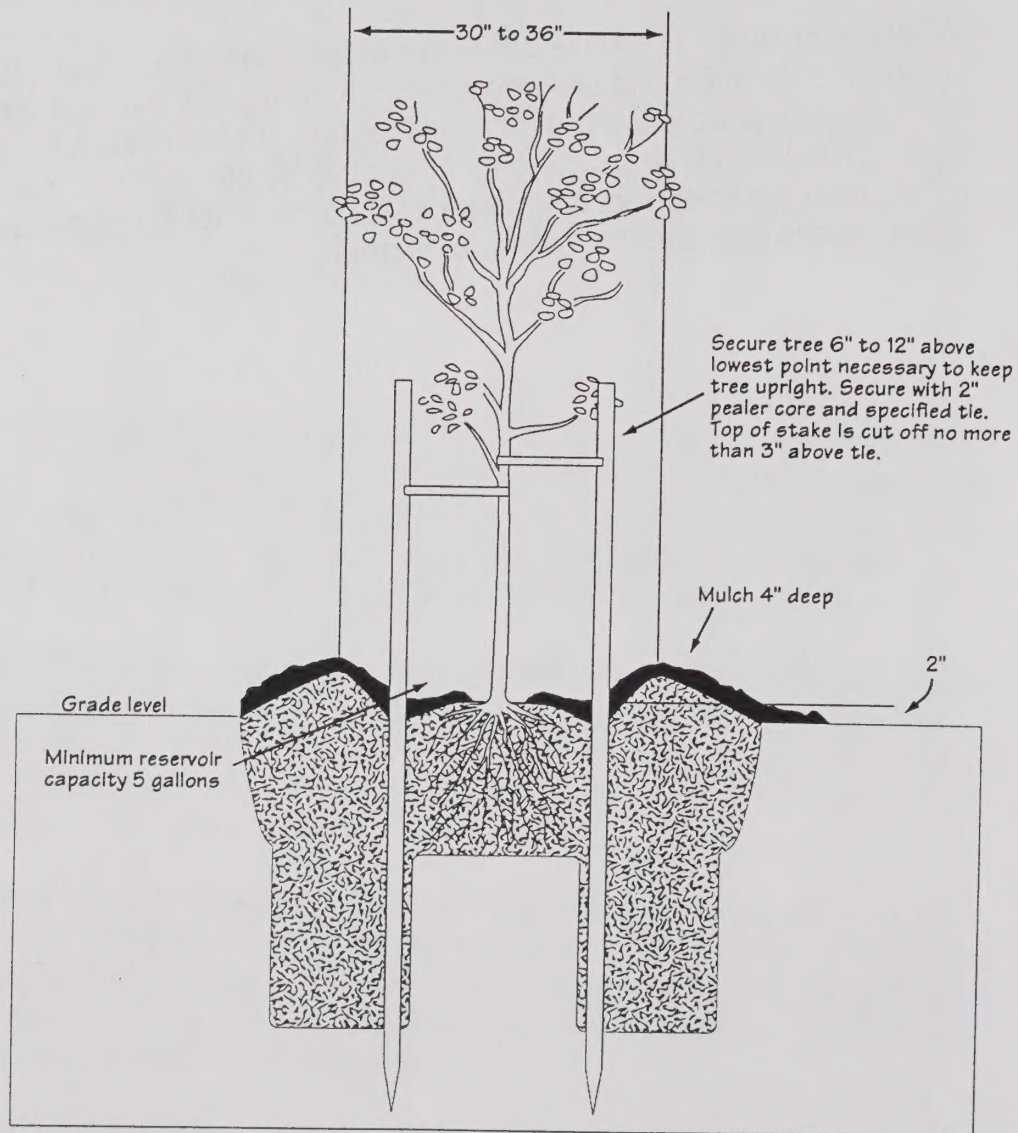
Staking and Ties - Two, 2" diameter stakes shall be driven securely into the soil on either side of the tree. Longer stakes shall be used whenever necessary to assure proper height of stakes and the need to have stakes driven deep and solid. Stakes shall be located on opposite sides of the tree from 12" - 15" away. The proper height at which the tree ties should be secured is 8" - 12" above the lowest point which hand support will hold the tree in a vertical position. The ties shall be loosely secured to allow maximum movement of the tree.

Stakes - 2" peeler core, 8' - 10' in length as necessary to securely support the tree in an upright manner.

Ties - 30" rubber tube ties, brand name Cinch-ties or E-Z Band available from local small business wholesalers and retailers.

Water reservoir- Watering basin should be composed of a slightly compacted berm around the tree at a 15" - 18" radius from the tree. All trees shall have watering basin capable of holding a minimum 5 gallons of water. The basin is to have a minimum capacity of 5 gallons. Contractor will be required to correct any basins that do not fulfill the required specifications over the first month of watering.

Completed planting



Mulching - All sites to be mulched with 4" of wood chips (about 6 cubic feet of chips). Mulch is to be no deeper than 1" at the trunk of the tree. Mulch should not contain fresh Redwood, Incense Cedar and Eucalyptus. These are acceptable after one year of composting. Chips must be relatively fine in texture and no stringy or partially chipped material such as palm fronds may be used.

Watering - All trees shall be watered immediately after planting. Watering should completely fill the tree basin 2 times. This is a minimum 10 gallons of water per tree applied at planting.

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